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DOE/EIS-0161

Final Programmatic
Environmental Impact Statement
for Tritium Supply and Recycling
Volume I
United States Department of Energy
Office of Reconfiguration
October 1995
Department of Energy
Washington, DC 20585
October 19, 1995

Dear Interested Party:

The Final Programmatic Environmental Impact Statement (PEIS) for Tritium Supply and Recycling has now been completed. Tritium is an essential component of every warhead in the current and projected United States nuclear weapons stockpile. Tritium decays at a rate of 5.5 percent per year and must be replaced periodically as long as the Nation relies on a nuclear deterrent. In accordance with the Atomic Energy Act of 1954, as amended, the Department of Energy is responsible for developing and maintaining the capability to produce nuclear materials such as tritium. Currently, the Department does not have the capability to produce tritium in the required amounts.

The Tritium Supply and Recycling PEIS evaluates the siting, construction, and operation of tritium supply technology alternatives and recycling facilities at each of five candidate sites. The PEIS also evaluates the use of a commercial reactor for producing tritium.

On October 10, 1995, the Department announced its preferred alternative, a dual-track strategy under which the Department would begin work on two promising production options: use of an existing commercial light water reactor and construction of a linear accelerator. The Savannah River Site in South Carolina has been identified as the preferred site for an accelerator, should one be constructed. Details on this preferred alternative can be found in the Executive Summary and in section 3.7 of Volume I of the PEIS. A Record of Decision will follow in late November.

The Department of Energy appreciates your continued participation in this Program.

Sincerely,
Stephen M. Sohinki, Director
Office of Reconfiguration

DOE/EIS-0161
October 1995

Changes to the Draft PEIS that are less than a paragraph, are shown in double underline in Final PEIS. Larger text changes are shown by sidebar notation.

COVER SHEET

RESPONSIBLE AGENCY: U.S. Department of Energy

COOPERATING AGENCY: U.S. Environmental Protection Agency
TITLE: Final Programmatic Environmental Impact Statement for Tritium Supply and Recycling (
CONTACT: For additional information on this Statement, write or call:

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For general information on the DOE National Environmental Policy Act process, write or call
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ABSTRACT: Tritium, a radioactive gas used in all of the Nation's nuclear weapons, has a shelf life and must be replaced periodically in order for the weapon to operate as designed. Currently, there is no required amounts of tritium within the Nuclear Weapons Complex.

The PEIS for Tritium Supply and Recycling evaluates the alternatives for the siting, construction, and operation of tritium supply and recycling facilities at each of five candidate sites: the Idaho National Engineering and Environmental Laboratory, the Nevada Test Site, the Oak Ridge Reservation, the Pantex Plant, and the Savannah River Site. The tritium supply and recycling facilities consist of four different tritium supply technologies: the Savannah River Modular High Temperature Gas-Cooled Reactor, Advanced Light Water Reactor, and Accelerator Driven System. Tritium. The PEIS also evaluates the impacts of the DOE purchase of an existing operating commercial light water reactor or the DOE purchase of irradiation services contracted from private industry reactors. Additionally, the PEIS includes an analysis of multipurpose reactors that would produce plutonium, and produce electricity.

Evaluation of impacts on land resources, site infrastructure, air quality and acoustics, water resources, soils, biotic resources, cultural and paleontological resources, socioeconomic impacts, radiologic impacts during normal operation and accidents to workers and the public, waste management, and other impacts are included in the assessment.

PUBLIC COMMENTS: In preparing the Final PEIS, DOE considered comments received by mail, fax, or telephone; transcribed from messages recorded by telephone, and those transmitted via Internet. Interactive public hearings were held in April 1995 at the following locations where comments were identified during discussions were summarized by notetakers: Washington, DC; Las Vegas, Nevada; Tennessee; Pocatello, Idaho; North Augusta, South Carolina; and Amarillo, Texas.

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ACRONYMS, ABBREVIATIONS, AND CONVERSION CHARTS Acronyms, Abbreviations, and Conversion Charts

Acronyms and Abbreviations

APT	Accelerator Production of Tritium
ALWR	Advanced Light Water Reactor
AQCR	Air Quality Control Region
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CWA	Clean Water Act
D&D	decontamination and decommissioning
DOD	Department of Defense
DOE	Department of Energy
DOI	Department of the Interior
DOT	Department of Transportation
DP	DOE Office of the Assistant Secretary for Defense Programs
EA	environmental assessment
EIS	environmental impact statement
EM	DOE Office of the Assistant Secretary for Environmental Management
EPA	Environmental Protection Agency
ES&H	environment, safety and health
HAP	hazardous air pollutants
HE	high explosive(s)
HEPA	high efficiency particulate air
HEU	highly enriched uranium
HI	Hazard Index
HLW	high-level waste
HQ	Hazard Quotient
HWR	Heavy Water Reactor
INEL	Idaho National Engineering Laboratory
IP	implementation plan
Leq	equivalent sound level
LLW	low-level waste
MHTGR	Modular High Temperature Gas-Cooled Reactor
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act of 1969
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRC	Nuclear Regulatory Commission
NRHP	National Register of Historic Places
NTS	Nevada Test Site
ORNL	Oak Ridge National Laboratory
ORR	Oak Ridge Reservation
OSHA	Occupational Safety and Health Administration
PEIS	programmatic environmental impact statement
PM10	particulate matter of aerodynamic diameter less than 10 micrometers
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
ROI	region-of-influence
SAR	Safety Analysis Report
SARA	Superfund Amendments and Reauthorization Act
SDWA	Safe Drinking Water Act

SHPO	State Historic Preservation Officer
SRS	Savannah River Site
START	Strategic Arms Reduction Treaty
TOC	total organic compounds
TRU	transuranic
TSCA	Toxic Substances Control Act
TSP	total suspended particulates
TSS	tritium supply site
USFWS	U.S. Fish and wildlife Service
USGS	U.S. Geological Survey
VOC	volatile organic compounds
VRM	Visual <u>Resource Management</u>
WIPP	Waste Isolation Pilot Plant

Chemicals and Units of Measure

BGY	billion gallons per year
Btu	British thermal units
Ci	curie
CCl4	carbon tetrachloride
CO	carbon monoxide
CFC	chlorofluorocarbons
dB	decibel
dBA	decibel A-weighted
DCE	1, 2-dichlororethylene
F	Fahrenheit
ft^2	square feet
ft^3	cubic feet
ft^3/s	cubic feet per second
g	gram
gal	gallon
GPD	gallons per day
gpm	gallons per minute
GPY	gallons per year
HCFC-22	chlorodifluoromethane
HMX	cyclotetramethylenetetranitramine or 1, 3, 5, 7-tetranitro-1, 3,5, 7-tetrazocine
hr	hour
kg	kilogram
kV	kilovolt
kVA	kilovolt-ampere
kW	kilowatt
kWh	kilowatt hour
lb	pound
lb/hr	pounds per hour
lb/yr	pounds per year
Li	lithium
mCi	millicurie (one-thousandth of a curie)
mCi/ml	millicurie per milliliter
mg	milligram (one-thousandth of a gram)
mg/l	milligram per liter
MGD	million gallons per day
MGY	million gallons per year
mrem	millirem (one-thousandth of a rem)
MVA	megavolt-ampere
MW	megawatt
Mwe	megawatt electric
Mwh	megawatt hour
MWt	megawatt thermal
nCi	nanocurie (one-billionth of a curie)
nCi/g	nanocuries per gram
NO2	nitrogen dioxide
NOx	nitrogen oxides
O3	ozone
Pb	lead
PCB	polychlorinated biphenyl
pCi	picocurie (one-trillionth of a curie)
pCi/l	picocuries per liter
PETN	pentaerythritoltetramtrate

ppb	parts per billion
ppm	parts per million
Pu	plutonium
RDX	cyclotrimethylenetrinitrainine
rem	roentgen equivalent man
SO2	sulfur dioxide
TATB	triaminotrinitrobenzene
TCA	1,1, 1-trichloroethane
TCE	trichloroethylene
TNT	trinitrotoluene
U	uranium
yd^3	cubic yards
uCi	microcurie (one-millionth of a curie)
uCi/g	microcuries per gram
ug	microgram (one-millionth of a gram)
ug/kg	micrograms per kilogram
ug/l	micrograms per liter
ug/m3	micrograms per cubic meter
um	micron or micrometer (one-millionth of a meter)

Metric Conversion Chart

To Convert Into Metric			To Convert Out of Metric		
If you Know	Multiply By	To Get	If you Know	Multiply By	To Get
Length					
inches	2.54	centimeters	centimeters	0.3937	inches
feet	30.48	centimeters	centimeters	0.0328	feet
feet	0.3048	meters	meters	3.281	feet
yards	0.9144	meters	meters	1.0936	yards
miles	1.60934	kilometers	kilometers	0.6214	miles
Area					
Sq. inches	6.4516	Sq. centimeters	Sq. centimeters	0.155	Sq. inches
Sq. feet	0.092903	Sq. meters	Sq. meters	10.7639	Sq. feet
Sq. yards	0.8361	Sq. meters	Sq. meters	1.196	Sq. yards
acres	0.40469	hectares	hectares	2.471	acres
Sq. miles	2.58999	Sq. kilometers	Sq. kilometers	0.3861	Sq. miles
Volume					
fluid ounces	29.574	milliliters	milliliters	0.0338	fluid ounces
gallons	3.7854	liters	liters	0.26417	gallons
cubic feet	0.028317	cubic meters	cubic meters	35.315	cubic feet
cubic yards	0.76455	cubic meters	cubic meters	1.308	cubic yards
Weight					
ounces	28.3495	grams	grams	0.03527	ounces
pounds	0.4536	kilograms	kilograms	2.2046	pounds
short tons	0.90718	metric tons	metric tons	1.1023	short tons
Temperature					
Fahrenheit	Subtract 32 then multiply by 5/9ths	Celsius	Celsius	Multiply by 9/5ths, Fahrenheit then add 32	

Metric Prefixes

Prefix	Symbol	Multiplication Factor
exa-	E	1 000 000 000 000 000 000=10^18
peta-	P	1 000 000 000 000 000=10^15
tera-	T	1 000 000 000 000=10^12
giga-	G	1 000 000 000=10^9
mega-	M	1 000 000=10^6
kilo-	k	1 000=10^3
hecto-	h	100=10^2
deka	da	10=10^1
deci-	d	0.1=10^-1
centi-	c	0.01=10^-2
milli-	m	0.001=10^-3
micro-	u	0.000 001=10^-6
nano-	n	0.000 000 001=10^-9
pico-	p	0.000 000 000 001=10^-12
femto-	f	0.000 000 000 000 001=10^-15
atto-	a	0.000 000 000 000 000 001=10^-18



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